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[at least two] a first output port[s] is connected to the head-related transfer function unit for transmitting the spatialized audio signal.

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REMARKS

The following issues are outstanding in the present application:

- Claims 24-27 have been rejected under 35 U.S.C. §102(b) as being anticipated by Cooper et al. (4,910,799); and
- Claims 1-23 have been rejected under 35 U.S.C. §103 in view of Ohno (5,512,938) and Tanaka et al. (5,598,478).

35 U.S.C. §102

Claims 24-27 have been rejected under 35 U.S.C. §102(b) as being anticipated by Cooper et al. (hereinafter Cooper). A rejection under 35 U.S.C. §102 is only appropriate where each and every feature set forth in the claims is present in the reference relied upon. The system according to the invention is very different from Cooper. Claim 24 has been amended to recite features that manifest the significant distinctions. As amended, claim 24 is directed toward "a conference bridge." The reference does not show or suggest a conference bridge. The operation of the claimed conference bridge is entirely different from the stereo processing system shown in Cooper. Cooper shows a stereo system for processing reproductions of audio signals. Cooper does not have a conference bridge.

The language of claim 24 as submitted may have led the Examiner to some confusion. Claim 24 has now been amended to more clearly set forth the structure. In a conference bridge as set forth in claim 24, multiple parties, presumably at different locations, are participating in a conference from remote locations over a communication channel such as a telephone network. The conference bridge imparts a spatialized characteristic to one of the participants so that another participant, when listening to the conference, is aware of a spatialized component to at least one of the audio inputs it is receiving. For the

sake of illustration only, an embodiment within the scope of this claim is illustrated in figure 2. For example, in figure 2A, conference participant A receives audio signals from participants B, C and D, each with their own spatialized orientation. Please note that claim 24 is limited only in accordance with its terms and not by this explanatory reference to the embodiment of figure 2.

The action relies on the embodiment illustrated in figure 1B of Cooper, et al. It appears that the embodiment of figure 1B is provided only to maintain spatial integrity for an audio reproduction and does not impart a spatialized component to an audio signal, i.e., "to produce at least one spatialized audio signal," as recited in claim 24.

We also point out that a careful reading of Cooper shows that the features referred to in the action do not correlate to the recited features. Figure 1B shows an artificial head 102 with ear-placed microphones 114 and 116. The office action improperly correlates unit 140 of Cooper to a head-related transfer function unit. According to column 7, lines 16-20, unit 140 is a compensation network which comprises a cross-talk cancellation network and a naturalizing network. This is quite distinct from the recitation in claim 24 as amended, which states, "A head-related transfer function unit connected to at least one of said input ports for imparting a head-related transfer function to a corresponding audio signal to produce at least one spatialized audio signal." The purpose of unit 140 is an audio processor to maintain spatial integrity of the stereo input signals and not to impart a spatial component to an audio signal according to claim 24.

Additionally, it would not have been obvious to add the conference bridge to the stereo system of Cooper since the audio signal is not transmitted to a remote location. There is no suggestion or motivation to include a conference bridge. The claims are not anticipated by or rendered obvious over Cooper, therefore, withdrawal of the rejection under 35 U.S.C. §102 is respectfully requested.

Claims 25 and 26 depend directly from claim 24 and, as such, include all of the limitations thereof. Claims 25 and 26 are not anticipated by Cooper, therefore, withdrawal of the rejection under 35 U.S.C. §102 is respectfully requested.

Claim 27 recites the steps of generating two sets of spatialized signals from two monaural signals using two HRTF's, compiling a composite signal from two spatialized signals and transmitting the composite signal. Cooper does not show or suggest this combination. Applicants point out that there is no motivation for modifying the Cooper device to satisfy the recited limitations. Cooper states that the output of the signals are coupled to a set of loud speakers or a record/playback system. Even if the microphone 114 and 116 outputs were considered monaural signals, the signals are not spatialized using at least two head-related transfer functions. Using an acoustic head 102 in Cooper is a way to generate an output that is representative of a single head-related transfer function. Furthermore, Cooper does not compile a composite signal from two sets of spatialized audio signals. We note that the inputs to speakers 140 and 142 combine to make at most a single set of spatialized audio signals. The claims are not anticipated by or rendered obvious over Cooper. Therefore, withdrawal of the rejection under 35 U.S.C. §102 is respectfully requested.

35 U.S.C. §103

Claims 1-23 have been rejected under 35 U.S.C. §103 in view of Ohno and Tanaka et al. (hereinafter Tanaka). The Office action states that it would have been obvious to combine the teleconference terminal of Ohno with the sound image localization control apparatus of Tanaka. Claim 1 recites "a conference station comprising: right and left spatially disposed microphones connected to a communication channel for receiving right and left audio signals, wherein the differences between the right and left audio signals represent a head-related transfer function". Ohno and Tanaka do not show or suggest spatially disposed microphones connected to a communication channel for receiving right and left

audio signals, wherein the differences between the right and left audio signals represent a head-related transfer function.

Ohno teaches a teleconference system with no suggestion of transmitting left and right audio signals which have a head-related transfer function. The objective of the Ohno reference is to provide a teleconference terminal to improve the gaps in the audio signal, rather than to add spatial information to the transmitted signal.

Tanaka teaches a sound image localization control apparatus for a game machine. There are no microphones in Tanaka. There is no suggestion that a head-related transfer function could be transmitted over a communication channel in this reference. In fact, the concept of adding a conference system to Tanaka teaches away from his intended use of a head-related transfer function in a game machine (i.e., used in one stand alone station).

In determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious, but whether the claimed invention *as a whole* would have been obvious. The references relied upon may teach that all features of the claimed invention were *individually known* in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. There is no such objective reason disclosed in the references. Therefore, withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Regarding claims 2-12, these claims depend directly or indirectly from claim 1 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 2-12 including the limitations of claim 1 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Nothing in any of the references refers to or suggests of a head tracking sensor or a position simulator as specifically recited in claim 8. Claim 9 recites

the additional features of a video camera and a display. We note for completeness that Ohno shows a teleconference terminal with video capabilities. However, Ohno does not recognize any spatial aspects of handling such a teleconference. Similarly, the features of claims 10 and 11 are not shown or suggested by the references relied upon.

Claim 13 recites "transmitting audio information representative of said spatialized audio from the conference station across a communication channel to a remote station". Ohno and Tanaka do not show or suggest transmitting audio information representative of said spatialized audio. Applicants point out that there is no motivation for modifying the Ohno and Tanaka references to satisfy the limitation of "transmitting audio information representative of said spatialized audio from the conference station across a communication channel to a remote station." As stated above, there is no reasonable expectation of successful modification of the Tanaka reference to include the a conference system of Ohno. A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention. Therefore, withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 14 depends directly from claim 13 and as such include all of the limitations thereof. Applicants submit that the differences between what is set forth in claim 14 including the limitations of claim 13 from which it depends, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 15 recites "a head-related transfer function unit connected to the communications system for imparting a head-related transfer function to the audio signal to produce a spatialized audio signal." Ohno and Tanaka do not show or suggest a head-related transfer function unit connected to communications system. Applicants point out that there is no motivation for modifying the Ohno device to satisfy the limitation of a head-related transfer

function unit connected to a communications system. Ohno teaches a teleconference system with no suggestion of a head-related transfer function unit. Tanaka teaches a sound image localization control apparatus for a game machine. There is no suggestion of that the head-related transfer functions could be transmitted over a communication channel in this reference. If the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. Therefore, withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claims 16-18 depend directly from claim 15 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 16-18, including the limitations of claim 15 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 19 recites "sending the spatialized audio signal from the spatial sound conference bridge to a receiving station." Ohno and Tanaka do not show or suggest sending the spatialized audio signal from the spatial sound conference bridge to a receiving station. Applicants point out that there is no motivation for modifying the Ohno device to satisfy the limitation of "sending the spatialized audio signal from the spatial sound conference bridge to a receiving station". Ohno teaches a teleconference system with no suggestion of sending a spatialized audio signal. The objective of the Ohno reference is to provide a teleconference terminal to improve the gaps in the audio signal, rather than to add spatial information to the transmitted signal. Tanaka teaches a sound image localization control apparatus for a game machine. There is no suggestion that a spatialized audio signals could be transmitted to a receiving station in this reference. In fact, the concept of adding a conference system to Tanaka teaches away from his intended use of spatialized signals in a game machine (i.e., used in one stand alone station). If the proposed combination of the prior art would

change the principle of operation of the prior art invention being modified, then the teaching of the references are not sufficient to render the claims prima facie obvious. Therefore, withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claims 20 and 21 depend directly from claim 19 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 20 and 21, including the limitations of claim 19 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 22 recites transmitting an audio signal from a transmitting station to a receiving station where the audio signal has been imparted with a head-related transfer function. Ohno and Tanaka do not show or suggest transmitting an audio signal from a transmitting station to a receiving station where the audio signal has been imparted with a head-related transfer function. Ohno teaches a teleconference system with no suggestion of transmitting an audio signal from a transmitting station to a receiving station where the audio signal has been imparted with a head-related transfer function. The objective of the Ohno reference is to provide a teleconference terminal to improve the gaps in the audio signal, rather than to add head-related information to the transmitted signal. Tanaka teaches a sound image localization control apparatus for a game machine. There is no suggestion that a head-related transfer function could be from a transmitting station to a receiving station in this reference.

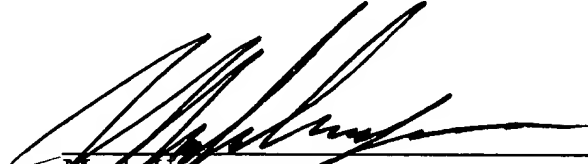
Claim 23 depends directly from claim 22 and, as such, includes all of the limitations thereof. Applicants submit that the differences between what is set forth in claim 23, including the limitations of claim 22 from which it depends, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

CONCLUSION

This application is in condition for allowance, and early notice of same is earnestly solicited. Should the examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, he is invited to contact applicants' representative by telephone at the number indicated below.

Respectfully submitted,

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